Appl. No. 09/176,639
Amdt. Dated August 27, 2004
Reply to Office action of June 2, 2004

Claim Amendments:

Please cancel claims 17, 18, 19, 20, 41 and 51.

16. (currently amended): A touch pad system comprising:

a sensor layer;

an insulative layer disposed [[on]] over said sensor layer; and

a touch layer disposed [[on]] over said insulative layer, said touch layer having a conductivity selected to create an ~~electrical~~ image of a conductive object that is larger than [[a]] an area of contact of said conductive object ~~contacting said touch layer~~, and wherein said sensor layer capacitively detects the image of said conductive object when a user places a conductive object proximate said touch layer.

17. (cancelled)

18. (cancelled)

19. (cancelled)

20. (cancelled)

21. (currently amended): The touch pad system of claim 16 wherein said conductive object is contactable with said touch layer, said conductive object configured to contact said touch layer ~~forming~~ with said area of contact, said touch layer configured to ~~spread out an electrical~~ form the image responsive to said ~~area of~~ contact.

22. (currently amended): The touch pad system of claim 16, wherein said image in said touch layer ~~is configured to form~~ forms a larger effective capacitive plate for coupling to said sensor layer when said touch layer is contacted by said conductive object.

23. (currently amended): The touch pad system of claim 21, wherein said ~~electrical~~ image of said conductive object is about the size of a finger when said area of contact is defined by a tip on a conductive fine-tipped stylus.

24. (currently amended): The touch pad system of claim 16, wherein ~~a resistance~~ the conductivity of said touch layer is configured to limit the size of said ~~electrical~~ image ~~within the limits of said sensor layer, wherein said electrical image is formed by said conductive object contacting said touch layer~~ to approximately four times the area of contact of said conductive object.

25. (previously presented): The touch pad system of claim 16, wherein said touch layer is formed with a conductive material disposed in a plastic carrier.

26. (previously presented): The touch pad system of claim 25, wherein said conductive material comprises carbon powder.

27. (previously presented): The touch pad system of claim 16, wherein said insulative layer, said touch layer and said sensor layer are transparent.

28. (currently amended): The touch pad system of claim 27, further comprising:

a display in operative communication below said sensor layer, said display configured to be viewable through said sensor layer, said insulative layer, and said touch layer.

29. (currently amended): The touch pad system of claim 28, wherein said display is configured to provide visual feedback to [[a]] the user of the touch pad system.

30. (currently amended): The touch pad system of claim 16, wherein ~~a user is in electrical communication with said conductive object~~ the conductive object comprises a conductive stylus holdable by a user such that said user is in electrical communication with said stylus.

31. (previously presented): The touch pad system of claim 16, wherein said conductive object comprises one of metal and conductive plastic, wherein said conductive object is electrically conductive.

32. (currently amended): The touch pad system of claim 16, wherein said conductive object includes a conductive tip, said conductive tip [[is]] selected from the group consisting of a wide stylus, a ball of conductive foam, and a circular metal plate with a ball joint.

33. (previously presented): The touch pad system of claim 16, wherein said conductive object comprises a fine tipped conductive pen.

34. (previously presented): The touch pad system of claim 16, further comprising:

a bezel disposed on said touch layer, wherein said bezel is configured to prevent edge distortion.

35. (previously presented): The touch pad system of claim 16, wherein the touch pad system is configured to compensate for edge distortion by calibration means.

36. (currently amended): The touch pad system of claim 35, wherein said calibration means comprises~~:~~

~~measurement of a stylus position at locations on said sensor layer;~~

~~tabulation of said measurements of said stylus position;~~

~~development of a mathematical function from said tabulation; and~~

~~calculation of~~ a correction function configured to compensate for edge distortion ~~from said mathematical function~~, wherein said correction function can be applied to each of ~~said~~ measured ~~stylus positions~~ conductive object position during operation of the touch pad system.

37. (currently amended): A touch pad system comprising:

a sensor layer;

an insulative layer disposed [[on]] over said sensor layer;

a conductive touch layer disposed [[on]] over said insulative layer, wherein when a user places a conductive object proximate said conductive touch layer said sensor layer detects a change in capacitance, said conductive touch layer configured to ~~expand a contact area~~ create an image larger than an area of contact of [[a]] said conductive object ~~contacting said conductive layer~~ to increase the detected change in capacitance; and

a means for distinguishing an identity of said object.

38. (currently amended): The touch pad of claim 37 wherein said means for distinguishing an identity of said object comprises a means based on a size of said ~~contact area~~ image.

39. (currently amended): The touch pad of claim 37 wherein said means for distinguishing [[an]] said identity of said conductive object comprises a means based on ~~a fluctuating capacitance signal~~ the detected change in capacitance, wherein said ~~conductive object contacting said conductive layer includes a contact area and said contact area~~ detected change in capacitance is variable over a time period for a finger proximate ~~contacting~~ said conductive touch layer and said ~~contact area~~ detected change in capacitance is substantially constant over a time period for a stylus contacting said conductive touch layer.

40. (currently amended): The touch pad of claim 37 wherein said means for distinguishing an identity of said conductive object comprises a means based on a ~~strength of a capacitive signal~~ rate of change of the detected change in capacitance, wherein a stylus produces an immediate full strength detected change in capacitance ~~capacitive signal~~ upon contacting said conductive touch layer and a finger produces a gradually increasing detected change in capacitance ~~capacitive signal~~ as said finger approaches contacting said conductive touch layer.

41. (cancelled)

42. (currently amended): A touch pad system comprising:

a sensor layer;

an insulative layer disposed [[on]] over said sensor layer;

a conductive touch layer disposed [[on]] over said insulative layer, wherein when a user contacts a conductive object to said conductive touch layer said sensor layer detects a change in capacitance, said conductive touch layer having a conductivity selected to create an image of said conductive object that is larger than an area of contact of said conductive object to increase the detected change in capacitance, said conductive touch layer configured to produce a visual mark of [[a]] the conductive object contacting said conductive touch layer for providing visual feedback to the user; ~~and~~

~~a visual feedback to a user from said visual mark~~.

43. (currently amended): The touch pad sensor of claim 42 wherein said visual mark is produced by a mechanical contact of said conductive object with said conductive touch layer.

44. (currently amended): The touch pad sensor of claim 42 wherein said visual mark is produced by a chemical property ~~reaction resulting from contact~~ of said conductive object ~~with said conductive layer~~.

45. (currently amended): The touch pad sensor of claim 42 wherein said visual mark is an alteration in at least one of a color and a reflectivity produced by mechanical contact of said conductive object with said conductive touch layer.

46. (currently amended): The touch pad sensor of claim 42 wherein said visual mark is produced by a sacrificial material on a tip of said conductive object in response to mechanical contact of said conductive object with said conductive touch layer.

47. (currently amended): The touch pad sensor of claim 46 wherein said sacrificial material is ~~pencil~~ graphite.

48. (currently amended):The touch pad sensor of claim 42 wherein said visual mark is produced by a groove in a surface of said conductive touch layer in response to mechanical contact of said conductive object with said conductive touch layer, wherein said surface of said conductive touch layer comprises a pliant material.

49. (currently amended): The touch pad sensor of claim 42 wherein said visual mark produced by mechanical contact of said conductive object with said conductive touch layer is removable.

50. (currently amended): The touch pad sensor of claim 42 wherein said visual mark is produced by a layer of liquid crystal material coupled to said conductive touch layer in response to mechanical contact of said conductive object with said conductive touch layer.

51. (cancelled)

52. (new): A capacitive touch pad system comprising:

a sensor layer;

an insulative layer disposed over said sensor layer; and

a conductive touch layer disposed over said insulative layer, wherein said sensor layer, said insulative layer and said conductive touch layer are configured to form a capacitor with a conductive object when a user places said conductive object proximate said sensor layer, said formed capacitor having a capacitance determined in part by the conductive touch layer and the conductive object, and wherein the conductive touch layer has a conductivity selected to create an image of said conductive object that is larger than an area of contact of said conductive object to thereby increase the capacitance of the formed capacitor when contacting the conductive touch layer and facilitate sensing of the capacitance to determine a position of the conductive object.

53 (new): The touch pad system of claim 52, wherein said image of said conductive object is about the size of a finger when said area of contact is defined by a conductive stylus tip.

54 (new): The touch pad system of claim 52, wherein said conductive touch layer comprises a conductive material disposed in a plastic carrier.

55 (new): The touch pad system of claim 54, wherein said conductive material comprises carbon powder.

56 (new): The touch pad system of claim 52, wherein said insulative layer, said conductive touch layer and said sensor layer are transparent, and wherein a display is positioned beneath said sensor layer and images from the display are viewable through said sensor layer, said insulative layer and said conductive touch layer, said display configured to provide visual feedback to a user of the touch pad system.

57 (new): The touch pad system of claim 52, further comprising:

a bezel disposed over said conductive touch layer and covering a perimeter of said conductive touch layer, wherein said bezel is configured to limit edge distortion effects by preventing the conductive object from contacting the conductive touch layer at the perimeter.

58 (new): The touch pad system of claim 52, wherein the touch pad system is configured to compensate for edge distortion by use of a correction function applied to measured conductive object positions during operation of the touch pad system.

59 (new): The touch pad system of claim 58 wherein the correction function is generated by measurement of conductive object positions at multiple locations on said conductive touch layer, tabulation of said measurements of said conductive object positions, and development of a mathematical function from said tabulation.

60 (new): The touch pad system of claim 52, wherein the touch pad system is configured to distinguish an identity of the conductive object by determining a change in the capacitance over a selected time period when the conductive objective is positioned proximate the conductive touch layer, wherein the a variable change in capacitance over the selected time period corresponds to a finger determination and a substantially constant capacitance over the selected time period corresponds to a stylus determination.

61 (new): The touch pad system of claim 52 wherein the conductive touch layer is configured to produce a visual mark of the conductive object contacting said conductive touch surface.

62 (new): The touch pad system of claim 52 wherein the conductive touch layer has the conductivity selected such that the image has an area at least four times larger than the area of contact of said conductive object.

63. (new): A capacitive touch pad system comprising:

a sensor layer;

an insulative layer disposed over said sensor layer; and

a conductive touch layer disposed over said insulative layer, wherein said sensor layer, said insulative layer and said conductive touch layer are configured to form a capacitor with a conductive object when a user places said conductive object proximate said sensor layer, said formed capacitor having a capacitance determined in part by the conductive touch layer and the conductive object, and wherein the conductive touch layer comprises conductive carbon disposed in epoxy and has a conductivity selected to create an image of said conductive object that is at least four times larger than an area of contact of said conductive object to thereby increase the capacitance of the formed capacitor when contacting said conductive touch layer and facilitate sensing of the capacitance to determine a position of the conductive object.